

WHAT IS CLAIMED IS:

1. A method for producing a replaceable fuser roller member, the replaceable fuser member being adapted to be positioned on a machine mandrel in a fuser system of an electrophotographic machine to function as a roller in the electrophotographic machine, the method comprising:
 - a) mounting a high temperature nickel sleeve having an inside and an outside and a coefficient of thermal expansion on a mandrel having an outside, being configured to receive the sleeve over the outside of the mandrel and having a coefficient of thermal expansion equal to from about 80 to about 120 percent of the coefficient of thermal expansion of the sleeve in a temperature range from about 20 to about 325°C;
 - b) applying a coating of a primer comprising a silane coupling agent that contains epoxies to the outside of the sleeve;
 - c) applying a coating of a base cushion elastomer around the outside of the sleeve;
 - d) curing the base cushion elastomer;
 - e) machining the coating of the cured base cushion elastomer to a desired thickness;
 - f) applying a topcoat layer over the machined coating of the base cushion;
 - g) curing the topcoat layer; and,
 - h) removing the replaceable fuser member from the mandrel.
2. The method of claim 1, wherein said primer contains at least one of the group consisting of, (3 glycidoxypropyl)bis(trimethylsiloxy)methylsilane, 3-glycidoxypropyldimethylethoxysilane, (3-glycidoxypropyl) methyldiethoxysilane, 3-glycidoxypropylmethyl-di-isopropenoxy silane, 3-glycidoxypropylpentamethyl-disiloxane, and 3-glycidoxypropyltrimethoxysilane.

3. The method of claim 2, wherein said primer contains at least one of the group consisting of, (3-glycidoxypropyl)bis(trimethylsiloxy)methylsilane and (3-glycidoxypropyl)dimethylethoxysilane.

5 4. The method of claim 1, wherein said sleeve is of the same material as the machine mandrel.

10 5. The method of claim 1, wherein said mandrel has a coefficient of thermal expansion equal to from 90 to 110% of the coefficient of thermal expansion of the sleeve.

6. The method of claim 1, wherein said sleeve is of a thickness from about 0.001 to about 0.05 inches.

15 7. The method of claim 1, wherein said mandrel comprises at least one of high temperature nickel, carbon steel and copper/zinc alloys.

20 8. The method of claim 1, wherein said desired thickness of the coating of the cured base cushion layer is from about 0.6 to about 50 mm.

9. The method of claim 1, wherein said base cushion coating is selected from the group consisting of silicone rubbers, silicon polymers, silicone rubbers containing fillers and silicone polymers containing fillers.

25 10. The method of claim 9, wherein said base cushion coating contains at least one filler and is thermally conductive.

11. The method of claim 1, wherein said base cushion is cured at a temperature up to about 205°C.

30 12. The method of claim 1, wherein said topcoat layer is cured at a temperature up to about 275°C.

13. The method of claim 12, wherein said topcoat layer is cured at a temperature from about 220 to about 275°C.

14. The method of claim 1, wherein said sleeve is removed
5 from the mandrel by selectively cooling the mandrel.

15. The method of claim 1, wherein said sleeve is removed from the mandrel by selectively heating the replaceable fuser member.

10 16. The method of claim 1, wherein said topcoat layer comprises at least one material selected from the group consisting of thermoplastic fluorocarbon polymers and thermoplastic fluorocarbon random copolymers.

15 17. The method of claim 1, wherein said cured thermoplastic polymer is a thermoplastic fluorocarbon random copolymer containing a bisphenol curing agent residue, a particulate filler containing zinc oxide and an aminosiloxane.

20 18. The method of claim 1, wherein said cured thermoplastic polymer is a thermoplastic fluorocarbon random copolymer containing a bisphenol curing agent residue, a particulate filler containing zinc oxide, an aminosiloxane and antimony-doped tin oxide particles.

19. In a method for producing a replaceable fuser member, adapted to be positioned on a machine mandrel in a fuser system of a electrophotographic machine to function as a roller in the electrophotographic machine by mounting a high temperature nickel sleeve on a mandrel configured to

5 receive the sleeve over the outside of the mandrel including the steps of: applying a coating of a primer comprising a silane coupling agent containing epoxies to the outside of the sleeve; applying a coating of the base cushion elastomer around the outside of the sleeve; curing the base cushion elastomer; machining the coating of the cured base cushion elastomer to a desired thickness; applying a topcoat over

10 the machine coating of the base cushion; curing the topcoat layer and removing the replaceable member from the mandrel; the improvement comprising: forming the mandrel of a metal having a coefficient of thermal expansion equal to from about 80 to about 120 percent of the coefficient of thermal expansion of the sleeve in a temperature range from about 20 to about 325°C.

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20. The method of claim 19, wherein said coefficient of thermal expansion of the mandrel is from about 90 to about 110 percent of the coefficient of thermal expansion of the sleeve.